

## PATENT ABSTRACTS OF JAPAN

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### (54) METHOD FOR MANUFACTURING VINYL CHLORIDE GLOVES

#### (57)Abstract:

PURPOSE: To obtain vinyl chloride gloves which have excellent reversible parting properties from a hand mold during their manufacture in addition to such advantages as being easily detachable, free from dust generation, and superb hot water-proofness, anti-artificial sweating, anti-abrasion and bend-resistance.

CONSTITUTION: A hand die filled with a film of PVC resin layer on the surface by immersion of the die in a vinyl chloride sol liquid, is soaked in a synthetic resin emulsion containing fine polyamino acid resin powder with an average grain dia. of 0.5 to 50 $\mu$ m or a mixed fine powder of said fine polyamino acid resin powder and fine silica powder with an average grain dia. of 0.5 to 5 $\mu$ m dispersed uniformly in 100 pts.wt. of resin solid. Further, the hand die is heated and globes are parted from the die after the formation of a synthetic resin film on the vinyl chloride resin film.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is excellent in reversal unmolding nature from a hand type, and is easy to detach and attach, does not have generating of dust, and relates to the manufacture approach of a vinyl chloride glove of having the endurance in periodic duty, such as warm water-proof nature and artificial-proof \*\*\*\*.

[0002]

[Description of the Prior Art] After being again immersed in the solution which distributed talc and a calcium carbonate to homogeneity at water after having been immersed in vinyl-chloride-resin sol liquid, making the hand type gel with heating as a manufacturing method of a vinyl chloride glove and forming membranes conventionally and evaporating water with remaining heat, generally the approach of carrying out reversal unmolding from a hand type at about 50 degrees C is performed widely.

[0003]

[Problem(s) to be Solved by the Invention] The attachment and detachment to a hand are not easy, and the fine particles which especially fell out in the precision instrument activity since the fine particles of talc and a calcium carbonate adhered to a hand and fell out adhere to a machine etc., and cause defect generating, and the vinyl chloride glove obtained by the above-mentioned approach does not fit an activity. After forming a vinyl-chloride-resin layer in a hand type in view of such a trouble until now, the approach (JP,63-235508,A, JP,1-221501,A) of carrying out immersion processing or the approach (JP,4-119102,A) of carrying out immersion processing by the synthetic-resin emulsion which blended the organic bulking agent is proposed in the finishing agent containing the approach (JP,60-119204,A) of carrying out immersion processing of the particle silica by the synthetic-resin emulsion distributed to homogeneity, a vinyl chloride, acrylic resin, and chlorinated rubber, or the finishing agent containing urethane resin.

[0004] However, the gloss on the front face of processing changes selectively at 200-250 degrees C in the case of processing, and the heating process for 5 - 10 minutes, commodity value falls or unmolding from a hand type is difficult for any [ these ] approach, and also the coat which formed membranes by artificial-proof \*\*\*\*, warm water-proof nature, etc. at the time of wear of the obtained glove falls out, or it has the problem of being cracked. this invention person etc. results in this invention as a result of examination that the trouble of the above-mentioned conventional technique should be canceled.

[0005]

[Means for Solving the Problem] Namely, after immersing this invention in vinyl-chloride-resin sol liquid, heating a hand type and forming a vinyl-chloride-resin layer on a front face, A described [ above ] hand type is immersed into the synthetic-resin emulsion which carried out 5-40 weight section combination of the mixed impalpable powder of polyamino acid resin impalpable powder with a mean particle diameter of 0.5-50 micrometers or this polyamino acid resin impalpable powder, and silica impalpable powder with a mean particle diameter of 0.5-5 micrometers to the resin solid content 100 weight section. Heat, a synthetic-resin emulsion layer is made to form on the vinyl-chloride-resin film,

and the manufacture approach of the vinyl chloride glove characterized by subsequently carrying out reversal unmolding is offered.

[0006]

[Function] This invention uses the synthetic-resin emulsion which carried out 5-40 weight section combination of the mixed impalpable powder of polyamino acid resin impalpable powder or polyamino acid resin impalpable powder, and silica impalpable powder to the resin solid content 100 weight section, as described above. By being immersed, heating the hand type which formed the vinyl-chloride-resin layer on a front face, in this emulsion, and forming the above-mentioned impalpable powder content synthetic-resin film on the vinyl-chloride-resin film the glove with which the unmolding nature from a hand type was good, and unmolded, and was obtained -- attachment and detachment -- it is easy, and dust is not generated but the glove which has warm water-proof nature, artificial-proof \*\*\*\*, etc., and has the endurance in which periodic duty is possible is obtained.

[0007] As a synthetic-resin emulsion, kinds, such as vinyl chloride resin, vinylidene chloride resin, an acrylic ester (meta) copolymer, a vinyl chloride-vinylidene-chloride copolymer, a vinylidene-chloride (meta) acrylic ester copolymer, silicon resin, a fluororesin, and urethane resin, or two sorts or more of mixed emulsions are used by this invention. It is desirable to add various additives, such as a surface active agent usually used, a thickener, a defoaming agent, and a leveling agent, on the occasion of the activity of this synthetic-resin emulsion.

[0008] As polyamino acid resin impalpable powder, an omega-alkyl acidic-amino-acid N-carboxylic anhydride (N-carboxylic anhydride is hereafter called NCA), for example, gamma-methyl glutamate - NCA, gamma-ethyl glutamate - NCA, gamma-benzyl glutamate - NCA, It NCA(s). beta-methyl -- asparagus -- gate-NCA and beta-ethyl -- asparagus -- gate - beta-benzyl Aspara gate - Neutral amino acid, such as NCA - NCA, For example, a valine, a norvaline, a leucine, an isoleucine, a norleucine, NCA(s), such as a phenylalanine and a methionine, are mentioned. The optically active substance, Any of racemic modification may be used and such mixture can also be used. For example, gamma-methyl-L-glutamate - A monomer dissolves NCA easily. It dissolves into the organic solvent with which a polymer serves as an insoluble solution, for example, a methyl ethyl ketone, (MEK). The polymerization initiator which has active hydrogen while stirring, for example, an amine compound, alcohols, Water etc. Moreover, the impalpable powder which removes MEK and is obtained from the impalpable powder distribution solution which trickles tertiary amine as a catalyst and is obtained if needed, Or although the impalpable powder ground and obtained is meant and the particle size is adjusted to arbitration by the addition of a polymerization initiator, agitating speed, polymerization temperature, grinding conditions, etc. after removing a solvent from the polymer solution with which a polymer trickles a polymerization initiator and is obtained in a meltable organic solvent As mean particle diameter of the polyamino acid resin impalpable powder used for this invention, 0.5-50 micrometers is suitable. moreover -- as silica impalpable powder -- the thing of the range of 0.5-5-micrometer mean particle diameter -- suitable -- \*\*\*\* -- any -- the above -- being out of range -- if -- a coat -- aesthetic property is not desirable in the slipping effectiveness running short.

[0009] 5 - 40 weight section is suitable for the amount of polyamino acid resin impalpable powder or polyamino acid resin impalpable powder, and the silica impalpable powder used to the synthetic-resin solid content 100 weight section, and while the coat front face which will be obtained if the effectiveness of addition is not seen under in 5 weight sections and 40 weight sections are exceeded becomes coarse too much and a feel worsens, the physical properties also fall. Abbreviation 1 / 2 amount of polyamino acid resin impalpable powder is suitable for the amount of the silica impalpable powder used in the case of using together polyamino acid resin impalpable powder and silica impalpable powder, it can adjust surface irregularity according to concomitant use, and can raise a feeling of a fit further.

[0010] The approach of this invention is immersed in vinyl-chloride-resin sol liquid, is immersed at 160-180 degrees C into the synthetic-resin emulsion which distributed the mixed impalpable powder of polyamino acid resin impalpable powder or polyamino acid resin impalpable powder, and silica impalpable powder to homogeneity in the hand type which heated for 8 - 10 minutes at 200-250 degrees

C, and formed the vinyl-chloride-resin layer on the front face, and forms a synthetic-resin layer on a vinyl-chloride-resin layer with remaining heat. The obtained glove has the good reversal unmolding nature from the hand type in 50-70 degrees C, and attachment and detachment are easy, warm water-proof nature, artificial-proof \*\*\*\*, and detergent-proof nature are good, and omission of a coat and generating of a crack are not seen, either.

[0011] Since the description of this invention using the mixed impalpable powder of polyamino acid resin impalpable powder or polyamino acid resin impalpable powder, and silica impalpable powder as a bulking agent is not dissolved at 200-250 degrees C at the time of processing unlike organic bulking agents, such as other polymethylmethacrylates, nylon, a polycarbonate, polyethylene, and melamine resin, it is that are easy to do the unmolding activity from a hand type, and there is no deterioration of the commodity value by appearance change. Furthermore, even if a feel with a hand is soft and absorbs water, it does not swell.

[0012]

[Example] Hereafter, an example explains this invention to a detail further. In addition, all number of copies is the weight sections.

As shown in example 1 table 1, in the vinyl chloride paste sol liquid which distributed the vinyl chloride paste resin (Nippon Zeon Co., Ltd. make, trade name ZEON 121) 100 section, the plasticizer (DOP) 110 section, the stabilizer (calcium-Ba-Zn) 3 section, and the coloring agent (titanium) 1 section to homogeneity, it was immersed for 10 seconds and the hand type made from pottery was pulled up, and in the condition that a vinyl chloride paste sol does not trickle, with the 200-250-degree C heating furnace, it heated for 10 minutes and membranes were formed. Subsequently, the vinyl-chloride-resin emulsion 100 section of 45% of solid content, the methacrylic ester copolymer 100 section of 45% of solid content, The silicon denaturation acrylic emulsion 10 section of 30% of solid content, the polyamino acid resin impalpable powder 30 section with a mean particle diameter of 2micro, It blends each the stabilizer 1 section, a defoaming agent, a leveling agent, and the 0.5 sections of thickeners, and above, it pulls up gradually and the hand type which formed the vinyl-chloride-resin layer at the front face is cooled radiationally in it, after being immersed for 5 seconds at 180 degrees C in the emulsion liquid adjusted to 7% of solid content with distilled water. Then, reversal unmolding was carried out at 50 degrees C whenever [ hand mold temperature / type / hand ], and the vinyl chloride glove was obtained. The physical-properties test result of the obtained glove was shown in a table 1.

[0013]

[A table 1]

	実 施 例						比 較 例	
	1	2	3	4	5	6	1	2
塩化ビニルペーストゾル (固形分 45%)	100	100	100	100	100	50	100	—
メチルメタクリレート共重 合樹脂 (固形分 45%)	100	100	100	100	100	150	100	—
シリコン樹脂 (固形分 30%)	10	10	10	—	—	10	—	—
フッ素樹脂 (固形分 30%)	—	—	—	10	—	—	—	—
ポリウレタン樹脂 (固形分 45%)	—	—	—	—	10	—	—	200
ポリアミノ酸樹脂微粉末 (平均粒径 2 $\mu$ )	30	20	10	20	20	20	—	20
シリカ微粉末 (平均粒径 2 $\mu$ )	—	10	—	10	10	10	30	10
安定剤 (Ca-Ba-Zn)	1	1	1	1	1	1	1	1
消泡剤	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
増粘剤	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
レベリング剤	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
蒸留水	1514.5	1514.5	1248.5	1514.5	1571.5	1514.5	1517.5	1514.5
浸漬時の固形分 (%)	7	7	7	7	7	7	7	7
浸漬時の粘度 (cps/25°C)	50	70	50	70	70	70	100	60
外観 (1) 流れムラ クラック	○	○	○	○	○	○	○	×
反転脱型性 (2)	○	○	○	○	○	○	×	○
耐温水性 (3) 外 観	○	○	○	○	○	○	○	×
密着性	○	○	○	○	○	○	○	○
耐人工汗性 (4) 外 観	○	○	○	○	○	○	×	×
密着性	○	○	○	○	○	○	○	○
耐摩耗性 (5) 傷付き程度	○	○	○	○	○	○	×	○
耐屈曲性 (6) クラック程度	○	○	○	○	○	△	△	○

[0014] The amount of the class of an example 2 - 6 synthetic-resin emulsion, the rate of a compounding ratio and polyamino acid resin impalpable powder, and the silica impalpable powder used was replaced with as shown in a table 1, and also the vinyl chloride glove was obtained like the example 1. In addition, the glove of the examples 1 and 2 of a comparison was manufactured similarly. The physical-properties test result of these gloves was shown in a table 1.

[0015] In addition, a degree passes along the approach and valuation basis of a physical-properties test, and they are \*\*.

(1) Appearance : the paint coat side was judged visually and the unusual appearance which can see [ crack / O, flow nonuniformity, ] a normal appearance was expressed as x.

(2) reversal unmolding nature: -- the processing side comrade after leaving it for 60 minutes, seeing the ease when carrying out reversal unmolding of the vinyl chloride glove from the hand type made from pottery, piling up the processing side comrade of the sample of 6cmx6cm magnitude, and applying a 3kg load in a 70-degree C ambient atmosphere -- slipping -- O and a processing side blocked easily what can exfoliate, and what cannot exfoliate was judged as x.

(3) Warm water-proof nature : the bad thing of O, appearance change, or adhesion was made into x for that normal by the adhesion test by appearance change and a cellophane tape after a sample is immersed into 50-degree-C warm water for 24 hours.

In 1000 cc water, Artificial-proof \*\*\*\* : (4) The sodium chloride 5 section, the phosphoric-acid 2-sodium 5 section, The 85% lactic-acid 5 section, the D-punt DIN acid sodium 5 section, the L-histidine monohydrochloride 0.5 section, The bad thing of O, appearance change, or adhesion was made into x for that normal by the adhesion test by appearance change and a cellophane tape after a sample is immersed in the 30-degree C artificial streaming sweat solution which dissolved the DL-aspartic-acid 0.5 section in homogeneity for 24 hours.

(5) Abrasion resistance : the processing side of a sample was made to go and come back to a friction cloth (Khanagin No. 5) 200 times with a Gakushin-type abrasion tester, the processing side got damaged, and omission of a degree and a coat were seen. \*\* and a coat separated those without abnormalities O and with the blemish, and that to which the blemish was attached to the vinyl chloride layer of further a lower layer was made into x.

(6) Flexibility : the sample was crooked 10000 times in 25-degree-C ambient atmosphere with the flexo testing machine, and exfoliation of a coat and the degree of a crack were seen. That in which the crack has generated what O and a crack are regarded as a little in those without abnormalities all over \*\* was made into x.

[0016] It was admitted that the glove obtained from the above-mentioned table 1 by the approach of this invention was excellent in almost all the physical-properties side besides the reversal unmolding nature at the time of manufacture compared with the glove obtained in the example of a comparison.

[0017]

[Effect of the Invention] As explained above, this invention by having formed the coat which consists of a synthetic-resin emulsion which contained the mixed impalpable powder of polyamino acid resin impalpable powder or polyamino acid resin impalpable powder, and silica impalpable powder as a bulking agent on the hand type vinyl-chloride-resin layer Reversal unmolding of the vinyl chloride glove from a hand type is easy, and also the desorption at the time of an activity can be easy, can obtain a glove with the endurance excellent also in various physical properties, and can use it widely as home manual bags, such as precision instrument operating, cooking, and wash.

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[Translation done.]